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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/042,647	01/08/2002	Kenneth Perlin	KPER-5	4255

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EXAMINER

CASCHERA, ANTONIO A

ART UNIT

PAPER NUMBER

2697

DATE MAILED: 07/29/2003

02

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary

Application No.

10/042,647

Applicant(s)

PERLIN, KENNETH

Examiner

Antonio A Caschera

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-11 and 15-18 is/are rejected.
- 7) ☒ Claim(s) 12-14 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 January 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☒ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Oath/Declaration

1. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because:

It does not identify the mailing or post office address of each inventor. A mailing or post office address is an address at which an inventor customarily receives his or her mail and may be either a home or business address. The mailing or post office address should include the ZIP Code designation. The mailing or post office address may be provided in an application data sheet or a supplemental oath or declaration. See 37 CFR 1.63(c) and 37 CFR 1.76.

Drawings

2. The drawings are objected to because:
 - a. In Figures 2 and 3, the 4 upper-right entries, in particular the entries labeled, "new," should be labeled with, "df/dy" and not, "df/dx" as each grouping of entries should show, "df/dy," "df/dx," "df/dz" and "f(xyz)."
 - b. Figures 2 and 3 do not provide any substantial information as the diagrams are too dark in color. A lightened version of these diagrams is required to further assist the examiner in considering the application for patent.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1-18 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claims 1-18, specifically claim 7, recite the limitation of generating a six bit quantity which is not described in the specification in such a way as to enable one skilled in the art to which it pertains. The specification solely discloses obtaining a six bit quantity from the sum of function b() however function b() comprises of arguments, i, j, k and B of which argument B is never described in the specification (see page 11, lines 3-17 of the specification). A definition of argument B and an explanation of how six bits are made from an integer lattice point i, j, k are required to further assist the examiner in understanding the invention at hand.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 9, 11 and 15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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In reference to claim 9, the function, “ b () ” is not defined in the claim, thus the claim is indefinite because there is no concise meaning to the value.

In reference to claim 11, the variable, “ s ” is not defined in the claim, thus the claim is indefinite because there is no concise meaning to the value.

In reference to claim 15, the function, “ O () ” is not defined in the claim, thus the claim is indefinite because there is no concise meaning to the value.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1, 3-6, 10 and 17 are rejected under 35 U.S.C. 102(e) as being anticipated by Morris (U.S. Patent 6,088,036).

In reference to claims 1 and 5, Morris discloses a method and apparatus for generating an image comprising a computer and a display connected to the computer upon which images are displayed (see column 1, lines 15-20 and 29-30 and Figure 1). Note the office interprets the labeled blocks of Figure 1 to be comprised within a computer as the components of a computer are well known in the art to include these components in particular, the input and output apparatus as disclosed by Morris in Figure 1 labeled “INP” and “DIS” (Official Notice). Morris also discloses geometry and rendering modules (see “GEOM” and “DRW” of Figure 1) used to

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produce images and found within the computer (see column 4, lines 17-35 and Figure 1). Morris discloses generating the images in a regular two-dimensional pixel array (see column 1, lines 30-32) which the office interprets as substantially similar to a grid. Morris also discloses generating the images reducing aliasing artifacts produced by primitive edges sloping relative to the pixel array axes (see column 1, lines 61-65).

In reference to claim 3, Morris discloses all of the claim limitations as applied to claim 1 above in addition, Morris discloses the apparatus to include an input means such as a keyboard allowing the user to manipulate or modify data in the computer (see column 4, lines 12-16 and "INP" of Figure 1).

In reference to claim 4, Morris discloses all of the claim limitations as applied to claim 1 above. Morris discloses generating the images in a regular two-dimensional pixel array (see column 1, lines 30-32) which the office interprets as substantially similar to a grid. Morris further discloses the rendering module (see "DRW of Figure 1) to include a 2-D array of pixel values (see column 4, lines 30-35).

In reference to claim 6, Morris discloses all of the claim limitations as applied to claim 5 above in addition, Morris discloses the apparatus to include an input means such as a keyboard allowing the user to manipulate or modify data in the computer (see column 4, lines 12-16 and "INP" of Figure 1).

In reference to claim 10, Morris discloses all of the claim limitations as applied to claim 6 above in addition, Morris discloses translating 2-dimensional image coordinates (x, y) from the viewing space to screen coordinates including a z coordinate indicating the depth of the object into the screen (see column 4, lines 17-30). Note the office interprets such a translation

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substantially similar to placing input coordinates into a simplicial grid or screen coordinate space. The office suggests amending claim 10 to further explain the term, "simplicial grid."

In reference to claim 17, Morris discloses all of the claim limitations as applied to claim 3 above in addition, Morris discloses the apparatus to include an input means such as a keyboard allowing the user to manipulate or modify data in the computer (see column 4, lines 12-16 and "INP" of Figure 1).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 2, 16 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morris (U.S. Patent 6,088,036).

In reference to claim 2, Morris discloses all of the claim limitations as applied to claim 1 above. Although Morris discloses the image generating apparatus to comprise of a database storing model data (see columns 3-4, lines 67-3) Morris does not explicitly disclose the geometry and rendering modules to include software disposed in the computer memory. It is well known in the art that renders and processors include software in order to execute commands as such software is stored in some sort of memory (Official Notice). It would have been obvious to one of ordinary skill in the art for Morris to implement the image producing modules incorporating software disposed in computer memory because it is well known in the art that computer renders

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and processors include software, essential for directing execution, that is ultimately stored in some sort of memory.

In reference to claims 16 and 18, Morris discloses a method and apparatus for generating an image comprising a computer and a display connected to the computer upon which images are displayed (see column 1, lines 15-20 and 29-30 and Figure 1). Note the office interprets the labeled blocks of Figure 1 to be comprised within a computer as the components of a computer are well known in the art to include these components in particular, the input and output apparatus as disclosed by Morris in Figure 1 labeled "INP" and "DIS" (Official Notice). Morris also discloses geometry and rendering modules (see "GEOM" and "DRW" of Figure 1) used to produce images and found within the computer (see column 4, lines 17-35 and Figure 1). Morris does not explicitly disclose producing a "visually isotropic" image however at the time the invention was made, it would have been obvious to one of ordinary skill in the art to modify the rendering of images of Morris to include producing "visually isotropic" images in order to reduce visual artifacts in all axes of the image included when rotating the image, reducing rotational artifacts, which ultimately help to produce a more realistic textured image in a 3-dimensional environment.

7. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morris (U.S. Patent 6,088,036) in view of (Perlin, "An Image Synthesizer." ACM Press, 1985).

In reference to claims 7 and 8, Morris discloses all of the claim limitations as applied to claim 6 above however Morris does not explicitly disclose generating a six bit quantity from an integer lattice point i, j, k . Perlin discloses generating four real numbers from an integer lattice point, these numbers being made up of a plurality of bits further used to calculate gradient values

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(see page 289, column 2, bullet #1 of Perlin). It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the image generating system of Morris with the bit manipulations of Perlin in order to conserve statistical character under image rotation and translation (see page 289, columns 1-2, under "Noise()").

Allowable Subject Matter

8. Claims 9, 11-13 and 15 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

In reference to claim 9, the prior art of record (Morris (U.S. Patent 6,088,036)) does not explicitly disclose the specific equation or it's equivalence found in claim 9.

In reference to claim 11, the prior art of record (Morris (U.S. Patent 6,088,036)) does not explicitly disclose the specific equations or there equivalences found in claim 11.

In reference to claim 12, claim 12 is objected to as being dependent upon rejected claim 11 from which claim 12 claims dependency.

In reference to claim 13, claim 13 is objected to as being dependent upon rejected claim 12 from which claim 13 claims dependency.

In reference to claim 15, the prior art of record (Morris (U.S. Patent 6,088,036)) does not explicitly disclose the specific computational complexity equation or it's equivalence found in claim 15.

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9. Claim 14 is objected to as being dependent upon rejected base claims, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

In reference to claim 14, the prior art of record (Morris (U.S. Patent 6,088,036)) does not explicitly disclose decomposing a hypercube into $n!$ simplices where each simplex corresponds to an ordering of an edge traversal of the hypercube from its lowest vertex $(0,0\dots 0)$ to its upper vertex $(1,1\dots 1)$ in combination with further limitations of claim 5 from which claim 14 is dependent upon.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Antonio Caschera whose telephone number is (703) 305-1391. The examiner can normally be reached Monday-Thursday and alternate Fridays between 7:00 AM and 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Mancuso, can be reached at (703)-305-3885.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872-9314 (for Technology Center 2600 only)

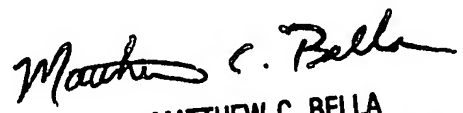
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Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive,
Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding
should be directed to the Technology Center 2600 Customer Service Office whose telephone
number is (703) 306-0377.

aac

7/25/03


MATTHEW C. BELLA
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TECHNOLOGY CENTER 2600